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ABSTRACT

Ten exercises based on the weather map provided in the national newspaper "U.S.A. Today" are used to teach intermediate grade students about weather. An overview describes the history of "U.S.A. Today," the format of the newspaper's weather map, and the map's suitability for teaching weather concepts. Specific exercises, which are briefly described, focus on location, direction, temperature, comparative temperature, climate control, jet stream, snow, rainfall, air masses, and world weather. Transparency masters containing student directions, worksheets, and maps are provided for each exercise. (LP)

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TEACHING WEATHER CONCEPTS

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Paper presented at the Annual Meeting of the National Council of Geographic Education (Toronto, Ontario, Canada, October 17-20, 1984).

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TEACHING WEATHER CONCEPTS

In September, 1982, the Gannett Company, the United State's largest newspaper chain initiated a daily newspaper, entitled U.S.A. Today. The daily (Monday-Friday) publication began in Washington, D.C., and rapidly spread to other distribution locations, such as, Atlanta, New York, Chicago, Los Angeles and Pittsburgh. Primarily, U.S.A. Today is aimed to meet the informational needs of the travelling businessman, suburbanites whose dailies are too local, and the highly mobile younger population that want to know whats going on back home. Fifty-four percent of the readers are suburban residents, 34% city dwellers, and 12% rural; 43% of the readers have household incomes of $35,000 or more, and 56% of U.S.A. Today's readers have attended or graduated from college. Originally the newspaper had hoped to amass a circulation of 2.35 million by 1987, but the acceptance has been overwhelming, reaching 5 million by September 1984.

U.S.A. Today tends to be more consumer-oriented than other dailies, providing extensive coverage of television, sports, finances, and briefer reports on the arts, law, religion and science. That portion of the newspaper which is of major interest to this presentation is the "weather section", which is located on the last page of section A. Although the page proofs are transmitted by satellite to local pressrooms - the color reproduction is the finest of any newspaper being printed in the United States. Compared to other weather sections, U.S.A. Today is top of the line. The weather page is divided into several sections:

(1) The Weather Map which utilizes a colormetric system of temperature distribution, uses symbols to illustrate precipitation forms and regional analysis. Color association is an excellent technique to teach distribution. We geographers have been using color

differences to illustrate data distribution for years, but the clarity of reproduction in U.S.A. Today is superb.

(2) Extremes - hi/lo.

(3) Area Weather Close-Up - a 24 city description (major metro.) with phone numbers.

(4) Four Day Highlight - a state-wide breakdown of principle cities in each state, illustrating temperatures over a three day period.

(5) World Weather Today - International locations.

(6) Extended Forecast - regional.

(7) Information Section - a daily information narrative pertaining to a particular weather subject. During the year this material could vary from adverse weather conditions, such as hurricanes, tornadoes, and local flooding to the shifting of the Jet Stream. On Fridays, snow conditions at popular ski resorts and beach conditions are given in season.

Geography has a prominent role in the fourth and sixth grade core curriculum in the State of Alabama, with an emphasis in place names, directions and in a minor way - earth-sun relations. Unfortunately, the geographic material is incorporated with other disciplines, not being utilized as a discipline of its own.

The ten exercise Weather Study based on the U.S.A. Today Weather Map is offered as a beginning point to arouse student curiosity and to encourage further interest in the basics of geography. The comparative aspects of the exercise can be altered to fit any area, and can be used on an extended daily basis during abnormal weather conditions. For example, this past January was an exceptionally cold month along the Gulf Coast when the "Siberian Express" dropped temperatures to single digits, or the use of the maps to illustrate the extent of the drought occurring in the Western United States would be timely examples.

LIST OF EXERCISES

The Weather Study covers ten items which appear on the U.S.A. Today Weather Map - these items involve weather elements, climatic controls and data interpretation. Although the exercises use information relative to Mobile, Alabama, any major location can be utilized.

Location

The first exercise utilizes the fundamentals of location - using an atlas or flat wall map of the United States to locate fourteen cities and to mark them on an attached sketch map. After the student has located and marked the location on the sketch map. the student checks this with the U.S.A. Today Weather Map.

Direction

The understanding of direction has always been an impediment to the fundamentals of basic geography. This has been most evident in results of the NCGE Competency-Based Geography Test. In the second exercise the cardinal points and directions are reinforced.

Temperature

Exercise three involves the computation of temperature hi's and lo's for specific locations on the U.S.A. Today Weather Map. In order to illustrate temperature changes to coincide with different physical locations in the United States.

Comparative Temperature

Exercise four attempts to utilize mean temperatures obtained in exercise three with specific geographic terms. Therefore, developing a mental construct of different environments.

Climatic Controls

Reinforcing the theme that climatic controls influence weather elements, exercise five attempts to match certain U.S.A. points with controls.

The Jet Stream

The importance of the Jet Stream has been emphasized in several editions of the U.S.A. Today Weather Map. Many of its characteristics, such as speed, direction, altitude, location and meandering paths. This exercise illustrates the influence, as well as the characteristics, of this fast flowing "river" of air.

Precipitation-Snow

This exercise involves the student in the legend interpretation of the U.S.A. Today Weather Map over a considerable length of time, and recording that information on a sketch map.

Precipitation-Rainfall

This exercise attempts to illustrate a seasonal distribution of rainfall in the United States and to use this information in comparing specific locations.

Air Masses

How air masses form and how they influence specific locations on the U.S.A. Today Weather Map is the basis of exercise #9. The United States is divided into regions, and the student is asked to discuss the weather conditions of these areas in relation to the air masses which cover the region.

World Weather

The final exercise of this study involves the use of the World Weather section of the U.S.A. Today Weather Map. The use of latitude and continentality help the student find similar locations in the United States.

These ten exercises are hoped to form a basis for continued use of the weather map in the elementary grades. The maxim, "Everybody is concerned about the weather" is true, why not use this as a basis for geographic education? Hopefully the ingenuity and creativeness of the teacher will enhance the information obtained on the U.S.A. Today Weather Map and weather interpretation will become a daily classroom activity.

TRANSPARENCY #1

WEATHER STUDY EXERCISES

1. Location
2. Direction
3. Temperature
4. Comparative Temperatures
5. Climatic Controls
6. The Jet Stream
7. Precipitation - Snow
8. Precipitation - Rain
9. Air Masses
10. World Weather

TRANSPARENCY #2A

WEATHER STUDY

Exercise #1 - Location

Locate the following cities on the accompanying map of the United States. (Use an atlas or world map of the United States.)

CITY	CHECK
A. Mobile, Alabama	____
B. Atlanta, Georgia	____
C. Detroit, Michigan	____
D. Bangor, Maine	____
E. Fargo, North Dakota	____
F. Wichita, Kansas	____
G. Denver, Colorado	____
H. Phoenix, Arizona	____
I. Salt Lake City, Utah	____
J. Los Angeles, California	____
K. Seattle, Washington	____
L. San Francisco, California	____
M. Miami, Florida	____
N. San Antonio, Texas	____

After you have located each city check its location on the "U.S.A. Today Weather Map."

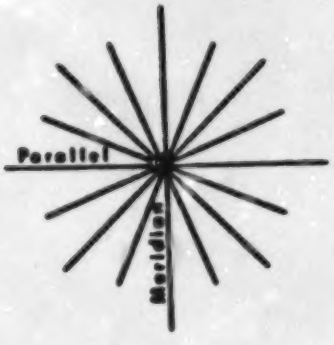
TRANSPARENCY #2B

TRANSPARENCY #3

WEATHER STUDY

Exercise #2 - Direction

Part I - Learn the cardinal points (directions) on the following sketch. Use the abbreviations at the right.



A.	N	I.	NNE
B.	S	J.	NNW
C.	E	K.	SSE
D.	W	L.	SSW
E.	SE	M.	WSW
F.	SW	N.	WNW
G.	NE	O.	ENE
H.	NW	P.	ESE

Part II - List the direction of the following cities from Mobile, Alabama.

City	Direction
Atlanta, Georgia	_____
San Antonio, Texas	_____
Miami, Florida	_____
Detroit, Michigan	_____
Seattle, Washington	_____
Wichita, Kansas	_____
San Francisco, California	_____
Fargo, North Dakota	_____

WEATHER STUDY

Exercise #3 - Temperature

RANGE/MEAN DAILY TEMPERATURE

The temperature range is the difference between the high temperature and the low temperature within a 24 hour interval.

The mean daily temperature is the mean of the temperature extremes for a 24 hour interval. (Use projected temperatures on the U.S.A. Today weather map.)

MIAMI, FL

DATE	HI-LO	RANGE	MEAN
June 11, 1984			
June 12, 1984			
June 13, 1984			
June 14, 1984			
June 15, 1984			
December 5, 1983			
December 6, 1983			
December 7, 1983			
December 8, 1983			
December 9, 1983			

BOSTON, MASS.

DATE	HI-LO	RANGE	MEAN
June 11, 1984			
June 12, 1984			
June 13, 1984			
June 14, 1984			
June 15, 1984			

BOSTON, MASS. continued

DATE	HI-LO	RANGE	MEAN
December 5, 1983			
December 6, 1983			
December 7, 1983			
December 8, 1983			
December 9, 1983			

SEATTLE, WASH.

DATE	HI-LO	RANGE	MEAN
June 11, 1984			
June 12, 1984			
June 13, 1984			
June 14, 1984			
June 15, 1984			
December 5, 1983			
December 6, 1983			
December 7, 1983			
December 8, 1983			
December 9, 1983			

PHOENIX, AZ

DATE	HI-LO	RANGE	MEAN
June 11, 1984			
June 12, 1984			
June 13, 1984			
June 14, 1984			
June 15, 1984			
December 5, 1983			
December 6, 1983			
December 7, 1983			
December 8, 1983			
December 9, 1983			

TRANSPARENCY #4C

KANSAS CITY, MO

DATE	HI-LO	RANGE	MEAN
June 11, 1984			
June 12, 1984			
June 13, 1984			
June 14, 1984			
June 15, 1984			
December 5, 1983			
December 6, 1983			
December 7, 1983			
December 8, 1983			
December 9, 1983			

TRANSPARENCY #5

WEATHER STUDY

Exercise #4 - Comparative Temperatures

Use the information obtained in Exercise #3 to complete the questions in Exercise #4. If you are unfamiliar with terms, consult a dictionary.

1. Which city had the highest mean temperature during the week June 11-15, 1984? _____

   Circle the geographic term which best describes the environment of this city.

   FOREST GRASSLAND DESERT TUNDRA

2. Which city had the lowest mean temperature during the week December 5-9, 1984? _____

   Circle the geographic term which best describes the environment of this city.

   MOUNTAINS PLAINS PLATEAUS HILLS

3. Which city had the least change in temperature range between June 11-15, 1984 - December 5-9, 1984? _____

4. Which city had the greatest change in temperature range between June 11-15, 1984 - December 5-9, 1984? _____

TRANSPARENCY #6

WEATHER STUDY

Exercise #5 - Climatic Controls

Match the following U.S.A.-Today weather cities with major climatic controls. Consult an atlas if needed.

1. Spokane, WA _____
2. Tucson, AZ _____
3. Buffalo, NY _____
4. Miami, FL _____
5. Aspen, CO _____
6. Detroit, MI _____
7. Salt Lake City, UT _____
8. San Francisco, CA _____
9. Chicago, IL _____
10. Albuquerque, NM _____

A. Biscayne Bay
B. Rocky Mountains
C. Lake St. Clair
D. California Current
E. Great Salt Lake
F. Sonoran Desert
G. Palouse Hills
H. Lake Michigan
I. Sandia Mountains
J. Lake Erie

Remember, a climatic control influences the weather conditions of a location.

How do the listed controls influence these cities?

1. San Francisco, CA (fog) -

2. Buffalo, NY (snow) -

TRANSPARENCY #7

WEATHER STUDY

Exercise #6 - The Jet Stream

Read the weather notes for the following days:

October 13, 1983	April 17, 1984
November 14, 1983	April 25, 1984
November 22, 1983	May 10, 1984
December 8, 1983	May 17, 1984
December 13, 1983	May 22, 1984
January 5, 1984	May 30, 1984
February 13, 1984	June 6, 1984
April 10, 1984	June 14, 1984

1. What is the Jet Stream?

2. Does the Jet Stream "meander?"

3. Does the Jet Stream shift its location?

4. Using the November 22, 1983 weather map, compare the location of the Jet Stream with temperatures in the West.

	Hi-Lo	Range	Mean
Denver, CO	_____	_____	_____
Billings, MT	_____	_____	_____
Cheyenne, WY	_____	_____	_____

5. Does the Jet Stream influence weather conditions?

6. On the attached sketch map of the United States - show the position of the Jet Stream on each of the listed dates.

November 13, 1983	April 17, 1984
November 22, 1983	April 25, 1984
December 13, 1983	May 17, 1984
February 13, 1984	May 30, 1984
	June 14, 1984

TRANSPARENCY #8

WEATHER STUDY

Exercise #7 - Precipitation-Snow

Precipitation is defined as the throwing down of moisture from a cloud. Rain and snow are two of the most common forms of precipitation; while sleet, hail, drizzle and glaze are less common forms.

Snow - In continental United States, during the 1983-84 year, the first snow fell on September 20, 1983 and the last snow fell on May 9, 1984. On the accompanying sketch map, attempt to draw a snow line, encompassing those areas which receive the most snow.

Be sure to use the map legend as a guide to find the locations.

List four geographic regions which have the greatest number of snow days.

1. _____
2. _____
3. _____
4. _____

TRANSPARENCY #9

WEATHER STUDY

Exercise #8 - Precipitation-Rain

Precipitation is defined as the throwing down of moisture from a cloud. Rain and snow are two of the most common forms of precipitation; while sleet, hail, drizzle and glaze are less common forms.

Rain

On the U.S.A. Today weather map, locate the follwoing cities.

Using the weather highlights, indicate the number of rainy days during May-June, 1984, and November-December, 1983.

	May-June	Nov.-Dec.
Mobile, Alabama	_____	_____
Seattle, Washington	_____	_____
Phoenix, Arizona	_____	_____
Des Moines, Iowa	_____	_____

Indicate possible weather control which influences the amount of rain or lack of rain in these areas.

1. Which city is wettest in May-June? _____

2. Which city is driest in May-June? _____

3. Which city is wettest in November-December? _____

4. Which city is driest in November-December? _____

TRANSPARENCY #10

WEATHER STUDY

Exercise #9 - Air Masses

An air mass is a large section of the lower atmosphere in which uniform temperature and humidity prevail. An air mass extends over thousands of square miles of the earth's surface.

An air mass acquires its characteristics from the area over which it originates (source region). Air masses are categorized according to the surface, as continental (c), maritime (m), and specified broadly as Polar (P), Tropical (T), Equitorial (E), or Arctic (A).

Air masses change their characteristics on they move. They are modifed as they enter different environments.

List of possible air mass designations, and probable source regions:

- cP - Continental Polar - Central Canada
- mP - Maritime Polar - Sea of Alaska
- mT - Maritime Tropical - Gulf of Mexico
- cT - Continental Tropical - Southwestern Deserts
- A - Arctic - Ice covered Polar zone
- E - Equitorial - Doldrums

Further classifications:

- "k" - An air mass colder than the surface over which it moves.
- "w" - An air mass warmer than the surface over which it moves.

Using the U.S.A. Today weather map, note the listed dates and decipher the possible air masses covering the United States and their source region.

Dates	Location	Air Mass	Source
June 23, 1983-Aug. 1, 1983	Southwestern U.S.	_____	_____
Sept. 2, 1983-Sept. 8, 1983	Southeastern U.S.	_____	_____
Oct. 12, 1983-Oct. 20, 1983	Upper Mid-West/ Great Lakes	_____	_____
Nov. 18, 1983-Nov. 30, 1983	Rocky Mountains/ Great Plains	_____	_____
Dec. 12-1983-Dec. 16, 1983	Pacific Northwest	_____	_____
Dec. 16, 1983-Dec. 29, 1983	North Central U.S.A.	_____	_____
Apr. 19, 1984-April 23, 1984	Southeastern U.S.A.	_____	_____

TRANSPARENCY #11

WEATHER STUDY

Exercise #10 - World Weather

Two factors combine to influence the average weather condition of a location: position on the continent and latitude.

Note the following cities in the World Weather section of the U.S.A. Today. Note the latitude, continental position and possible location in the United States that has a similar climate.

Remember, "weather" is the condition of the atmosphere at any given time, while "climate" is the conditions of the atmosphere over a considerable length of time.

Consult an atlas to find latitude locations. Possible continental locations are the cardinal directions, coastal, inland or mountain.

International Location	Latitude	Continental Position	U.S.A. Similarity
1. Moscow, U.S.S.R.			
2. London, England			
3. Rome, Italy			
4. Peking, China			
5. Jeruselem, Israel			
6. Athens, Greece			
7. Paris, France			
8. Berlin, W. Germany			
9. Stockholm, Sweden			
10. Geneva, Switzerland			